



## **NEXT STEP 02**

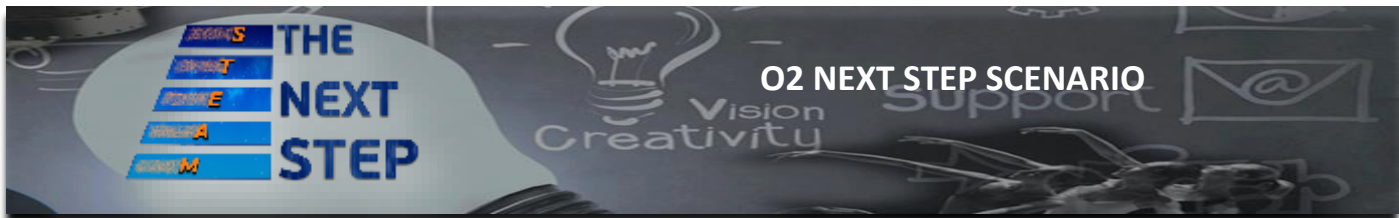
### ***NEXT STEP SCENARIO***

#### ***Enabled School Educational Scenario***

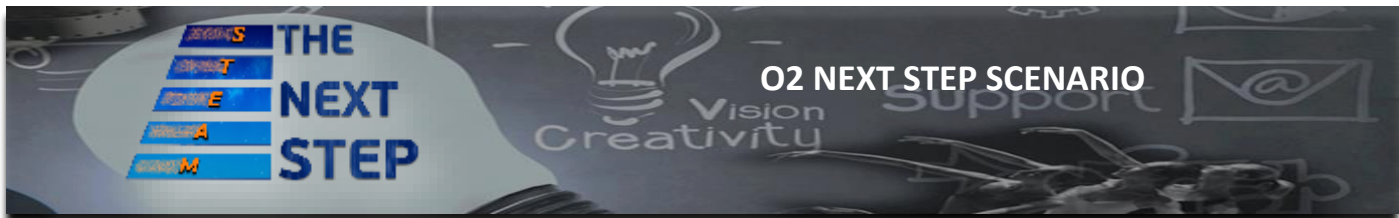


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<b>Short Description:</b>			



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## 1. Introduction

### Main aim

The NEXT STEP project is proposing a whole school approach to science learning. Building on previous successful European open schooling and STE(Arts)M initiatives, the project will bring about the NEXT STEP in education by providing a roadmap for the transformation of school classrooms into open and creative learning spaces. NEXT STEP methodological approach exceeds the state of the art regarding existing creative approaches and STEAM initiatives. In this framework the NEXT STEP project will design and set in operation the STEAM IDEAS' Square, an innovative learning environment which will be the nucleus of the school's activities. NEXT STEP will demonstrate how these environments a) can offer opportunities for deeper learning of STEAM, b) can improve the innovation and creative capacities of learners, c) can support the new role of teacher as a coach of the learning process, d) can facilitate effective cooperation with external stakeholders and e) can inspire policy-makers, school heads and school staff to imagine the schools of tomorrow.

### Vision of the Project

The NEXT STEP vision for a creative and innovative school is the development of the creative and innovative classroom of tomorrow, the STEAM IDEAS' Square, in which education relies on an interdisciplinary, arts-based methodology within an entrepreneurship and design thinking framework.

**STEAM IDEAS' Square - (SIS)** which will be the main core of the school's creative and innovative activities will have two substances: digital and physical. In its premises and via its digital tools in-school interaction between STEM and other disciplines schoolteachers and among all the relative stakeholders (students, educators, parents, artists, scientists, local community authorities, industrial stakeholders, and policy makers) will be established with purpose to run complex and exciting real-life educational world projects. Teams of students (from the same or different classes) can also work and cooperate under SIS umbrella.

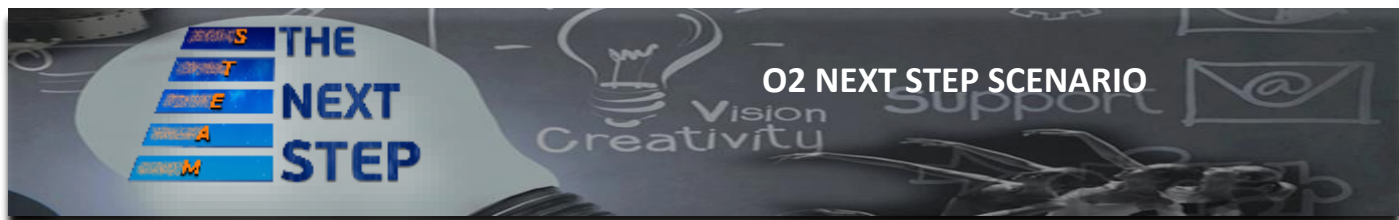
By connecting curious minds and specialists and lead them to think "out of the box" will help to speed up the flow of ideas to **transform the school and its classrooms to** a unique creative space for educational innovation and STEAM education.

Through collaboration and the appropriate pedagogies will be established prototyping, pedagogical innovation, creativity (along with distance learning opportunities) and well-being at school.

In addition, the capacity to work with external organizations so as to explore how such partnerships and networks can be built through a long-term strategy-based on trust and common objectives they contribute to key competence development.

**A way to implement and use the ideas of NEXT STEP project is through developing a series of scenarios of use that are in line with the proposed approach and involve schools in a series of creative and innovative activities for the improvement of the local cities, settlements, and communities' physical and built-up environments, while engaging key stakeholders (experts, researchers, local communities, businesses etc.) in the process. Different scenarios about different school typologies will be created and these with the help of the right Strategies will help schools to evolve**

**One of these scenarios that is suitable for a STARTER school (according to our typology) is the one presented later in this document.**



## 2. Essential Features of the STEAM IDEAS' Square

The development of key competences is further facilitated by the provision of context from other disciplines and can:

- a. offer opportunities for deeper learning of STEAM,
- b. improve the innovation and creative capacities of learners,
- c. support the new role as a coach of the learning process,
- d. facilitate the effective cooperation with external stakeholders and
- e. inspire policy makers, school heads and school staff to imagine the schools of tomorrow.

All the above in total in the context of a functional NEXT STEP STEAM IDEAS' square will drive to overcome the organizational and technical barriers and to integration of creative and innovative culture in every day school practices and to aggregate and create projects and activities customized to the specific needs of schools.

Deeper Learning Competences, as **defined in the Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning (2006/962/EC)** as described by the Hewlett Foundation model (Pellegrino & Hilton, 2013) can be adopted in order to define the exact indicators needed to measure the efficiency of the project's objectives. A selection of certain deeper learning competences that correspond to a range of ages wider than the high school students (which is the main target group of the deeper-learning competences model) can be classified in the following three groups (Frans & Andreotti, 2018):

**Group A: Cognitive competencies**

- (1) Mastering rigorous academic content - A1
- (2) Thinking critically - A2

**Group B: Interpersonal competencies**

- (3) Working collaboratively - B3
- (4) Communicating effectively - B4

**Group C: Intrapersonal competencies**

- (5) Learning to learn (C5)
- (6) Developing academic mindsets - C6

**As defined in the Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning (2006/962/EC):**

- F1) Literacy competence (GA1)
- F2) Multilingual competence
- F3) F3M.Mathematical competence and F3S. competence in science, F3T. technology and F3E.engineering, F3MS, F3ST, (STEM=F3)
- F4) Digital competence - F4
- F5) F5P.Personal, F5S.social and F5L.learning to learn competence (C5)
- F6) Civic competence
- F7) Entrepreneurship competence
- F8) F8C. Cultural awareness and F8E.expression competence

**We use the Competences as Features taxonomy from the European Parliament and the Council's recommendation in our scenario.**







### 3. NEXT STEP Scenario Identification

#### for the scenario with the title: SPACEMAN

##### 3.1. Scenario of Use in an Enabled School - General description.

*Students of all ages are fascinated by space and all that it entails. This scenario, aimed at lower secondary school students will involve collaboration between different teachers within the school: science teacher, art teacher, music teacher and technology teacher. The Spaceman scenario is a project oriented scenario consisting of 8 activities which will encourage synergies between the teachers mentioned above. The final output of the project- a music video on the topic of space, can be disseminated to the larger community outside the school. The activities described here can take place inside classrooms, ICT rooms, science labs or any space that can be designated/ designed as a STEAM IDEAS' square space.*



### 3.2 Scenario Identification Card

Category	Description
Title	<b>SPACEMAN</b>
Teaching theme/problem	<b>Through various activities students will get an appreciation on requirements for life in Space and on the moon</b>
Keywords	<i>Space, moon, gravity, forces</i>
Language	<i>English</i>
Thematic classification	<b>STEAM oriented Education</b>
Learning/Teaching main objectives:	<i>Learning about Space and what is required for life (S), (E), (M)</i>
Suggested age group	<i>12-14 years old</i>
Estimated level of difficulty	<i>Workshops can be easily set up and facilitated using equipment readily available in the classrooms, laptops, ICT available in the school</i>
Material and technical infrastructure needed	<i>STEAM IDEAS' Square place, ICT school infrastructure, 1-1 laptops/tablets/iPads.</i>
School - Stakeholders Synergies	<i>Outputs from activity can be shared with relevant stakeholders in the local community and through social media</i>
Typical intervention time	<i>6-8 weeks</i>
Teaching level	<i>Lower Secondary school (High School)</i>
Level of interactivity	<i>Medium</i>
Type of interactivity	<i>Physical, Digital, Educational field trips, Sosial Events, e.t.c.</i>
Authors, Publisher name	<i>Dr Bridget Kelly, Dr Daithí Kearney, DkIT</i>
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3.3 Scenario Identification Image












3.4 Title of Project

**Main Project: Produce a music video around the concepts of space and Life on the Moon**

Feel Step

					
Act #	Description of activities, strategies, methods, means, resources and synergies		Learning goals and outcomes Features/Competences	STEAM Fields	
A1	Science teacher	Shows videos, presentations and pictures of space, the moon landing	<b>Educational Method</b> Introduction to the theme and Socratic questioning	This activity will introduce students to the concepts around space, the moon and how mankind has travelled to the moon.	 
	<b>Tools:</b> IWB,P,				
A1	Students	Think-pair-share activities, note-taking. Using <a href="#">5.1.1. Main Project - Feel - Activity 1/2 Worksheet 1 - MP F A1/2 WS1</a>	• Can describe environment in space/the moon • Identifies the difficulties in living on the moon <b>F1, F3S, F5P, F5S, F6</b>	<b>In classroom duration</b>  <b>45m</b>	
	<b>Tools:</b> tablets, notebooks...				
A2	Science teacher	Shows videos, presentations, pictures of life, and what is needed for life on earth	<b>Educational Method</b> Inquiry	This activity will allow students to identify the different requirements for life <ul style="list-style-type: none"> <li>• Oxygen</li> <li>• Food</li> <li>• Shelter</li> <li>• Warmth</li> <li>• Water</li> </ul> <b>F1, F3S, F5P, F5S, F6</b>	 
	<b>Tools:</b> IWB, P.,				
A2	Students	Think-pair-share activities, note-taking, using <a href="#">5.1.1. Main Project - Feel - Activity 1/2 Worksheet 1 - MP F A1/2 WS1</a>	<b>Tools:</b> tablets, notebooks	<b>In classroom Duration</b> <b>30-45m</b>	
	<b>Tools:</b> tablets, notebooks				



	<b>(SIS) School Community synergies</b>	During A1, A2 and after A1, A2, the science teacher could collaborate with other teachers (music, art, drama) to create worksheets, online platforms, timeslots for using creative spaces (working in the STEAM Ideas' Square)	
	<b>School-Stakeholders Synergies</b>	Physical visit to Armagh Observatory and Planetarium	



Imagine Step



Act #	Description of activities, strategies, methods, means, resources and synergies		Learning goals and outcomes Features/Competences	STEAM Fields
A3	Science teacher	Show presentations, Youtube videos about life in the ISS, discuss what is needed to live on the moon, in space, discussions of gravity and the effects space has on the body.	<ul style="list-style-type: none"> <li>To describe what is needed to live on the international space station</li> <li>Discuss gravity and its effects</li> <li>Discuss the lack of gravity and its effects and how to overcome these issues</li> </ul> <p><b>F1, F3S, F5P, F5S, F6</b></p>	
	<b>Tools:</b> IWB, P, ...			
	Students	Think-pair-share activities, answering questions, word searches, crosswords, note-taking, using <a href="#">5.1.2. Main Project-Imagine-Activity 1/2 Worksheet 1 - MP   A1/2 WS1</a>		
<b>Tools:</b> tablets, notebooks...			In classroom duration 30-45m	
A4	Science teacher	Explain the difficulties in space travel, gravity, orbits Through presentations and various websites Talk about the discovery of Gravity- Sir Isaac Newton and Galileo	<ul style="list-style-type: none"> <li>Discuss what Gravity is</li> <li>Describe how rockets must overcome the forces of gravity</li> <li>Discuss what an orbit is</li> <li>Explain some challenges around getting rockets into space</li> <li>Perform experiments relating to gravity and forces</li> </ul> <p><b>F1, F3S, F5P, F5S, F6</b></p>	
	<b>Tools:</b> IWB, P			
	Students	Students will perform experiments to see Gravity at work, such as Galileo's original experiments They can measure the speed of falling objects relating the time of the fall to the objects' weight and size. Use marbles made of various sizes but of the same		
<b>Tools:</b> IWB, P			In class duration 30-45 min	


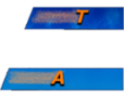



## O2 NEXT STEP SCENARIO

		material and drop them from the same height, using <a href="#">5.1.2. Main Project-Imagine-Activity 1/2 Worksheet 1 - MP   A1/2 WS1</a>	
		<b>Tools:</b> tablets, notebooks, marbles	
	School Community Synergies	Science teacher can collaborate with other teachers in the school to gain momentum for the next section of this scenario, creating and designing	
	School-Stakeholders Synergies		



## Create Step


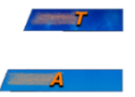
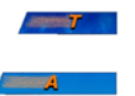
					
Act #	Description of activities, strategies, methods, means, resources and synergies		Learning goals and outcomes Features/Competences	STEAM Fields	
A5	<b>Art teacher</b>	Guide students to create artwork associated with space and what is required for living in space  <b>Tools:</b> Art materials, craft materials, PCs with graphics software	<ul style="list-style-type: none"> <li>To learn the usefulness of recycled materials</li> <li>To use a variety of different resources for creating artwork inspired by space</li> <li>To explore the best materials to create space suits</li> <li>To use recycled materials for using space suits</li> </ul>	 <b>In classroom duration</b>	
	<b>Students</b>	Students will work in pairs to produce various artwork associated with space etc. using <a href="#">5.1.3. Main Project-Create-Activity 1/2 Worksheet 1 - MP C A1/2 WS1</a>  <b>Tools:</b> tablets, notebooks, arts and craft materials, recycled material, PCs with graphics software			
A6	<b>Art teacher/Science teacher</b>	Guide students to make their own spacesuits, materials for spaceships etc. Use NASA, ESA for inspiration  <b>Tools:</b> IWB, P		<b>F1, F3S, F5P, F5S, F6,F8C</b>	
	<b>Students</b>	Students will work in pairs to create their spacesuits etc. and be able to explain their reasons for using the materials they chose, using <a href="#">5.1.3. Main Project-Create-Activity 1/2 Worksheet 1 - MP C A1/2 WS1</a>  <b>Tools:</b> tablets, notebook, arts and craft materials, recycled materials			
	School Community Synergies	Art class teacher can collaborate with the greater school community to exhibit the artwork around the school and to inspire other students to be curious about space			





	School-Stakeholders Synergies	The artwork and spacesuits can be exhibited during school events at which external stakeholders attend, artwork can be exhibited in local art centres
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Share Step

					
Act #	Description of activities, strategies, methods, means, resources and synergies		Learning goals and outcomes Features/Competences	STEAM Fields	
A7	<b>Music teacher</b>	Create a song on the topic of Space using all of the information garnered previously	<b>Educ Method</b> <i>Guided discovery</i>	<ul style="list-style-type: none"> <li>To create a song on the topic of space and what was learned previously</li> </ul> <b>F1, F3S, F5P, F5S, F6,F8C</b>	 <b>In classroom duration</b> 2-4 hrs
	<b>Tools:</b> IWB, P, Musical instruments				
	<b>Students</b>	This activity will involve the students creating songs around the topic of space			
A8	<b>Tools:</b> tablets, notebooks, musical instruments...		<ul style="list-style-type: none"> <li>To create a music video</li> <li>To share it in the school and with the wider community</li> </ul> <b>F1, F3S, F5P, F5S, F6,F8C</b>	 <b>In class duration</b> 2-4 hrs	
	<b>Technology/science teacher</b>	Create a music video for the song that was created.			<b>Educ Method</b> <i>Guided discovery</i>
	<b>Tools:</b> IWBS, P				
	<b>Students</b>	Students will work in pairs to create a music video around the topic of the moon, space			
	<b>Tools:</b> IWBS, P, PCs/laptops				
School Community Synergies	All teachers involved in the projects and the school principal will share produced music video via school social media channels				
School-Stakeholders Synergies	Principal will collaborate with appropriate stakeholder to have video shown at some local event during national or international science week, In Ireland this occurs in November				





## 4. References

Here you can add References that could support your scenario and you consider important to be included

## 5. ANNEXES

### 5.1 ANNEX 1 – Worksheets

#### 5.1.1. Main Project - Feel - Activity 1/2\_ Worksheet 1 - MP\_F\_A1/2\_WS1

Science teacher discusses with students through Socratic dialogues and showing them some videos (below) to the IWBS.

#### Socratic dialogue examples

*How much life is there on earth?*

*Is there life on the moon?*

*Is there life in space?*

*What is required for life on the earth?*

#### Examples of relevant videos

V1: <https://www.youtube.com/watch?v=qflgUuYrKbM>

V2: <https://www.youtube.com/watch?v=-Y04Zic1-r4>

V3: <https://www.youtube.com/watch?v=BHDMc2-uEoo>

V3: [https://www.youtube.com/watch?v=z\\_m0Prsht2k](https://www.youtube.com/watch?v=z_m0Prsht2k)

V5: <https://www.youtube.com/watch?v=6ejcOZDnyrk>

*Students in pairs they are discussing and answering one by one to their owns devices or notebooks.*

- They answer the above questions and note them into their tablet/laptop/iPad or notebooks.
- The answers are collected and presented in IWBS
- The dialogue continues and students continue to work in pairs.

<b>Essential Tip 1</b>	If digital devices are not present for students to use, could use: <a href="https://get.plickers.com/">https://get.plickers.com/</a>
	See it here in progress: <a href="https://www.youtube.com/watch?v=bejiz2HzUz8">https://www.youtube.com/watch?v=bejiz2HzUz8</a>







### 5.1.2. Main Project-Imagine-Activity 1/2\_ Worksheet 1 - MP\_I\_A1/2\_WS1

Science teacher discusses with students through Socratic dialogues and showing them some videos (below) to the IWBS.

#### Socratic dialogue examples

*What is needed to live on the moon or in space?*

*What effect does gravity have on the body?*

*What is gravity?*

*How was gravity discovered?*

#### Examples of relevant videos

V1: <https://www.youtube.com/watch?v=-Y04Zic1-r4>

V2: <https://www.youtube.com/watch?v=haSCaWkMmgI>

V3: <https://spaceplace.nasa.gov/what-is-gravity/en/>

V4: <https://www.juliantrubin.com/bigten/galileofallingbodies.html>

*Students in pairs they are discussing and answering one by one to their owns devices or notebooks.*

- They answer the above questions and note them into their tablet/laptop/iPad or notebooks.
- The answers are collected and presented in IWBS
- The dialogue continues and students continue to work in pairs.

### 5.1.3. Main Project-Create-Activity 1/2\_ Worksheet 1 - MP\_C\_A1/2\_WS1

Use online resources (videos, activities) to get ideas on creating space suits, examples of resources are below

<https://www.youtube.com/watch?v=W-9ieQ2xgsc>



[https://www.nasa.gov/pdf/143159main\\_Suited\\_for\\_Spacewalking.pdf](https://www.nasa.gov/pdf/143159main_Suited_for_Spacewalking.pdf)  
<https://www.youtube.com/watch?v=RWpltu8JGFM>  
<https://www.destinationspace.uk/resources/mission-modules/make-your-own-space-suit/>  
<https://spacecentre.co.uk/blog-post/how-to-make-a-spacesuit/>

#### 5.1.4. Main Project-Share-Activity 1/2\_ Worksheet 1 - MP\_CS\_A1/2\_WS1

##### Suggested playlists to get inspiration

- "Space Oddity" David Bowie (<https://www.youtube.com/watch?v=iYYRH4apXDo>)
- "Walking on the Moon" The Police (<https://www.youtube.com/watch?v=zPwMdZOIPo8>)
- "Man on the Moon" REM (<https://www.youtube.com/watch?v=dLxpNiFOYKs>)
- "Rocket Man" Elton John (<https://www.youtube.com/watch?v=DtVBCG6ThDk>)
- "To the Moon and Back" Savage Garden (<https://www.youtube.com/watch?v=HCm6gRHINqA>)



## 6. Abbreviations, short terms, apps used in Scenario of Use

- SIS: STEAM IDEAS' Square
- Stakeholders: Parents, special scientists, external Educators, authorities, entrepreneurs,
- IWBS: Interactive White Board System, Video Projector and interactive whiteboard.
- P. Presentation (like a pptx created with Powerpoint).
- Tablets. Electronic devices for personal use, like Android tablets or iPads.
- Laptops. Either in a lab or in classroom
- PCs. Computers in a lab.
- Plickers. <https://www.plickers.com/>
- qStopMotion: <http://qstopmotion.org/>
- <https://m.apkpure.com/kite-flying-layang-layang/br.pipacombate.maiworm/download?from=details>
- <https://apps.apple.com/us/app/real-kite-flying-simulator/id1448464346>

### Competences

- F1. Literacy competence
- F2. Multilingual competence
- F3. F3M. Mathematical competence and F3S. competence in science, F3T. technology and F3E. engineering //or/ F3MS, F3ST , (STEM=F3)
- F4. Digital competence
- F5. F5P. Personal, F5S. social and F5L. learning to learn competence
- F6. Civic competence
- F7. Entrepreneurship competence
- F8. F8C. Cultural awareness and F8E. expression competence



## NEXT STEP Partnership



Western Norway  
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ELLINOGERMANIKI  
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**NUCLIO**  
NÚCLEO INTERACTIVO DE ASTRONOMIA



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